LCN Fund Full Submission

Supplementary Answer Form

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Project code:	UKPN2002	Question Number	1
Question date	25 August 2011	Answer date	30 August 2011
Submission section question relates to	Section 3 – Project Business Case		
Topic	Rollout		
Question	What justification is there for assuming that each area of the UK will be installing a similar amount of MW of onshore wind as the project site?		
Notes on question			
Answer	The FPP extrapolation methodology described in Section 3 of the FPP pro-forma, was based on the Frontier Economics report "*Evaluating the case for introducing locational DUoS charges for CDCM generators – A report prepared for the Energy Networks Association, April 2011"* [1]. This report calculates DNO-specific growth rates in distributed generation (DG) based on the Forecast Business Plan Questionnaires (FBPQs) from DPCR5. The table below shows the annual DG growth rates by DNO area: [1] http://2010.energynetworks.org/storage/DOC%20-%20ENA%20final%20report%20-%2001-04-11%20-%20STC.pdf		

DNO Area	$g_{DG\%}$	g_{DGAbs} (MW p/substation)	Implied new generation p/yr (MW)
CE NEDL	10.4%	0.168	32.93
CE YEDL	10.1%	0.164	61.01
CN EAST	26.5%	0.275	120.45
CN WEST	15.4%	0.378	96.01
UKPN EPN	14.7%	0.131	59.74
UKPN LPN	10.7%	0.176	18.83
UKPN SPN	7.6%	0.131	30.39
ENW	12.9%	0.136	49.50
SPEN SPD	23.1%	0.085	36.98
SPEN SPM	6.4%	0.036	12.24
SSE SEPD	4.3%	0.023	11.16
SSE SHEPD	16.3%	0.062	26.47
WPD WALES	6.1%	0.058	10.90
WPD WEST	6.2%	0.025	8.05

Source: Frontier Economics

From the above table, the total of implied new DG connecting to distribution network by 2015 is 2.9 GW.

Furthermore, Frontier Economics uses the above information to consider three different rates of growth of DG connecting to the distribution network by 2021:

Low – 50% of the FBPQ growth rates – implies an additional 2.9 GW of distributed generation (DG) connecting to the distribution network by 2021;

Medium – actual FBPQ growth rates – implies an additional 5.8 GW of distributed generation (DG) connecting to the distribution network by 2021;

High – 150% of the FBPQ growth rates – implies an additional 11.6 GW of distributed generation (DG) connecting to the distribution network by 2021.

As described in Section 3 of the FPP pro-forma, the 'Medium' scenario was chosen by UK Power Networks as the basis of the FPP extrapolation methodology.

Frontier Economics report also includes an analysis on the number of distribution substations that would potentially require reinforcement to accommodate the above levels of DG. In the report these are called '*generation-dominated areas (GDA)'* and are defined as *'primary substations where thermal reinforcement is more likely to be caused by generation than*

demand, within a specific time period'. Further description of the GDA concept can be found in the "Attachments" section below.

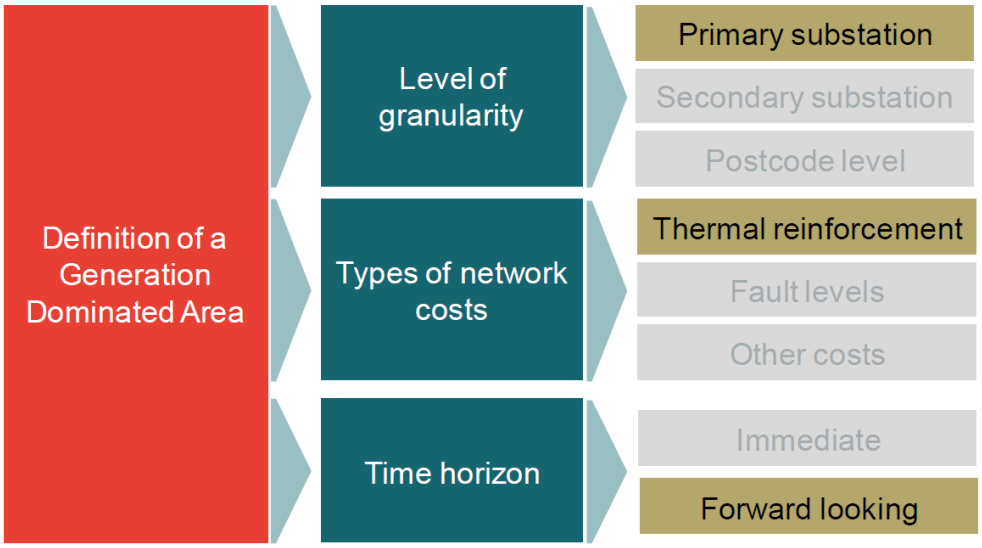
Frontier Economics indicates that DG connected under the 'Medium' scenario would be supplied by 157 GDAs (i.e. impacted primary substations) across the UK. The number of GDAs identified by DNO area for the 'Medium' growth rate scenario is presented in the table below.

	Medium Scenario		
DNO Area	No. GDA	Implied new DG (MW)	Average generation capacity per GDA (MW/GDA)
CE NEDL	6	329	55
CE YEDL	10	610	61
CN EAST (WPD)	37	1205	33
CN WEST (WPD)	7	960	137
UKPN EPN	19	597	31
UKPN LPN	3	188	63
UKPN SPN	5	304	61
ENW	16	495	31
SPEN SPD	12	370	31
SPEN SPN	7	122	17
SSE SEPD	1	112	112
SSE SHEPD	30	265	9
WPD WALES	3	103	34
WPD WEST	1	81	81
Total	157	5800	37

Source: Frontier Economics

The FPP trial area has 14 primary substations and the FPP methods to be trialled are expected to enable 188 MW of DG. This is equivalent to an average of 13 MW per primary substation. Following the definition of GDA by Frontier Economics, the primary substations within the FPP trial area can be considered as generation-dominated areas. Therefore the average generation capacity per GDA enable by the FPP methods is 13 MW. The average generation capacity per GDA enabled by the FPP methods is lower than the average generation capacity per GDA figures presented for all but one DNO in the above table (SSE SHEPD).

Therefore, whilst the level of implied DG varies for each DNO area the level of generation capacity connected to each GDA is typically higher than the 13 MW assumed by the FPP project, which represents a conservative, although robust and justifiable, figure.

Attachments	'Generation-dominated areas (GDAs)' are defined as 'primary substations where thermal reinforcement is more likely to be caused by generation than demand, within a specific time period'.  As the above figure sets out, Frontier Economics definition of a GDA: ▪ focuses on primary substations (rather than assets below the primary) ▪ focuses on whether or not generation growth is likely to trigger network expenditure (rather than simply looking at the balance between demand and generation) and more specifically, thermal reinforcement (rather than fault level related investment, for example); and ▪ is forward-looking, in the sense that it identifies whether this thermal reinforcement is likely to occur within a specific time period.
Verbal Clarifications (Consultants)	